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Factors Influencing Patients at Risk of Falling in the Emergency Department: A Systematic Literature Review

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Kata Kunci :

Faktor; IGD; Risiko Jatuh; Pasien IGD; Sasaran Keselamatan Pasien

Abstrak

Risiko jatuh pada pasien di instalasi gawat darurat (IGD) merupakan isu keselamatan yang signifikan, terutama pada populasi lansia dengan berbagai komorbiditas dan penggunaan obat ganda (polifarmasi). Studi ini merupakan tinjauan literatur yang diseleksi secara ketat melalui double blind. Diperoleh enam artikel yang dipublikasikan antara tahun 2021–2025. Artikel diperoleh dari database ProQuest, PubMed, CINAHL, ScienceDirect, dan Google Scholar dengan kata kunci terkait "emergency department," "fall risk," "Factor," and "Influencing." Evaluasi kualitas artikel menggunakan instrumen JBI. Faktor yang paling dominan yang memengaruhi risiko jatuh adalah riwayat jatuh sebelumnya dan polifarmasi. Faktor lain yang turut berkontribusi meliputi gangguan kognitif, demensia, gangguan mobilitas, penggunaan alat bantu, kelalaian tenaga kesehatan dalam skrining risiko jatuh, dan keterbatasan sumber daya manusia di IGD. Riwayat jatuh dan polifarmasi dapat dijadikan indikator utama dalam skrining awal risiko jatuh di IGD. Implementasi skrining berbasis risiko serta intervensi preventif yang sistematis penting untuk mencegah kejadian jatuh di IGD.

Keywords :

Emergency Department; ED Patient, Factor; Fall of Risk; Patient Safety

Abstract

Fall risk in patients within the Emergency Department (ED) is a significant patient safety concern, particularly among the elderly population with multiple comorbidities and concurrent medication use (polypharmacy). This study is a literature review selected through a rigorous double-blind process, resulting in six articles published between 2021 and 2025. The articles were retrieved from ProQuest, PubMed, CINAHL, ScienceDirect, and Google Scholar using relevant keywords: "emergency department," "fall risk," "factor," and "influencing." Article quality was assessed using the Joanna Briggs Institute (JBI) appraisal tool. The most dominant factors influencing fall risk were a history of previous falls and polypharmacy. Additional contributing

factors included cognitive impairment, dementia, mobility disorders, use of assistive devices, healthcare provider negligence in conducting fall risk screening, and limited human resources in the ED. History of falls and polypharmacy can serve as primary indicators in early fall risk screening in the ED. Implementing risk-based screening and systematic preventive interventions is crucial for reducing fall incidents in emergency settings..

INTRODUCTION

Fall risk is one of the most significant patient safety concerns in hospital settings, including the Emergency Department (ED). Approximately 10% of ED visits by patients aged ≥65 are due to falls, with 36–44% of these individuals experiencing adverse outcomes such as repeat visits or death within a year of the fall incident (Shankar et al., 2020). The risk increases with advancing age, comorbidities, and conditions such as dementia or physical frailty (Hollinghurst et al., 2022). Key risk factors for falls in ED patients include age ≥65 years, particularly those ≥75 years, which is significantly associated with physiological decline such as muscle weakness, gait disturbances, imbalance, and neurological conditions like dementia (Hollinghurst et al., 2022). Additionally, conditions like urinary incontinence further compromise stability and elevate the likelihood of falls, particularly when patients move unassisted to the bathroom.

Fall risk assessment tools such as the Morse Fall Scale (MFS) and Memorial Emergency Department Fall Risk Assessment Tool (MEDFRAT) have demonstrated clinical validity in identifying moderate to high-risk patients. Studies show that high-risk individuals have a hazard ratio (HR) of approximately 4.0 for mortality within 30 days of their ED visit compared to those at low risk. Moreover, clinical conditions such as sleep disturbances and incontinence are strongly correlated with fall risk, with odds ratios (ORs) exceeding 4 and 7, respectively (Lee et al., 2023).

ED crowding significantly contributes to the heightened fall risk. Crowding occurs when patient volume exceeds available space and resources, disrupting workflow, delaying care, and reducing clinical monitoring effectiveness. Even minor increases in patient load in the ED are significantly associated with higher fall risk, with an OR of 1.013 per unit increase in patient burden (Schacht et al., 2025). This suggests that the more overcrowded the ED becomes, the greater the likelihood of falls, particularly among vulnerable groups such as the elderly or those with mobility impairments. In overcapacity conditions, healthcare providers often struggle to maintain optimal supervision, and prolonged patient waiting times in triage or hallways exacerbate the problem. This decline in monitoring quality directly increases fall incidents, posing serious threats to patient safety and serving as an indicator of poor emergency care quality.

Despite various preventive interventions being implemented in EDs, their effectiveness in reducing recurrent fall incidents remains inconsistent. Some studies report that single interventions, such as patient education or risk assessments without systematic follow-up, do not significantly impact fall recurrence, with a relative risk (RR) of 0.93 and a p-value of 0.28, indicating statistical insignificance. However, more comprehensive multifactorial interventions show greater efficacy. Strategies involving patient and family education, balance or mobility training, and structured referrals to rehabilitation or geriatric services post-ED discharge significantly reduce monthly fall frequency (RR ≈ 0.69). These interventions also lower fall-related injury rates (RR ≈ 0.72) and reduce the likelihood of subsequent hospitalization after a fall (RR ≈ 0.76) (Chaeibakhsh et al., 2021).

These findings underscore the importance of integrating sustainable and cross-departmental fall prevention programs, beginning in the ED and extending throughout the care continuum, to enhance safety and quality of life for high-risk patients. Therefore, the present study aims to review the factors influencing fall risk among ED patients, with the goal of addressing modifiable contributors and reducing fall-related incidents.

METHODS

The Research Questions

The objective of this study is to systematically address the following research questions:
Q1: What factors influence patients at risk of falling?
Q2: Which factor has the most significant impact on patients at risk of falling?

Study Design

This study employs a systematic literature review design, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. The literature search was conducted electronically to identify relevant sources. The researchers performed a systematic search using several electronic databases, including Google Scholar, PubMed, ScienceDirect, CINAHL, and ProQuest, in accordance with the formulated research questions.

Data Search Strategy

The search strategy utilized generic keywords structured according to the PICO framework and Medical Subject Headings (MeSH) terminology. The keywords included, Population: "Patients" AND "Emergency Department" AND "Fall Risk" AND "Factor". These keywords were used to identify literature relevant to the research topic. The search was limited to articles published between January 2021 and July 2025, and only English-language articles were selected to avoid misinterpretation and facilitate translation.

Data Screening Process

The inclusion and exclusion criteria for the literature selection process were as following, Inclusion Criteria: Studies that discuss factors influencing fall risk in patients within Emergency Departments (EDs), are available in full text, and published between 2021 and 2025. And exclusion Criteria: Studies involving populations outside of the ED setting, and articles written in languages other than English.

All references obtained from the search were exported to Zotero to facilitate duplication detection and preliminary screening of titles and abstracts (see Figure 1). This step ensured that no duplicate articles were included in the review. Five researchers independently conducted the selection process using a blind review mode to maintain objectivity. All references that passed the initial screening were then reviewed in full text to assess eligibility.

Article Quality Appraisal

Articles that met the inclusion criteria were then appraised using the Joanna Briggs Institute (JBI) critical appraisal tools. As shown in Table 1, four out of six articles were rated as high quality. Subsequently, data extraction was carried out independently by the researchers using a standardized extraction form. Each article was then analyzed to ensure methodological alignment with the research questions and objectives.

Table 1. Article Quality Appraisal (JBI Instrument)

No	Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Score	Category
1.	Bergström et al., (2025)	✓	✓	✓	✓	✓	✓	✗	✓	-	-	-	7/8	Good
2.	Mulfiyanti et al., (2024)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11/11	Very Good
3.	García-Martínez et al., (2024)	✓	✓	✓	✓	✓	✓	✗	✓	-	-	-	7/8	Good
4.	Barton et al., (2024)	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	9/9	Very Good
5.	Hellinger et al., (2025)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11/11	Very Good
6.	Torun, (2023)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11/11	Very Good

The following are the questions include JBI Instrument:

Q1: Were the inclusion criteria clearly defined?

Q2: Were the study subjects and the setting described in detail?

Q3: Was the exposure measured in a valid and reliable way?

Q4: Were objective, standard criteria used for measurement of the condition?

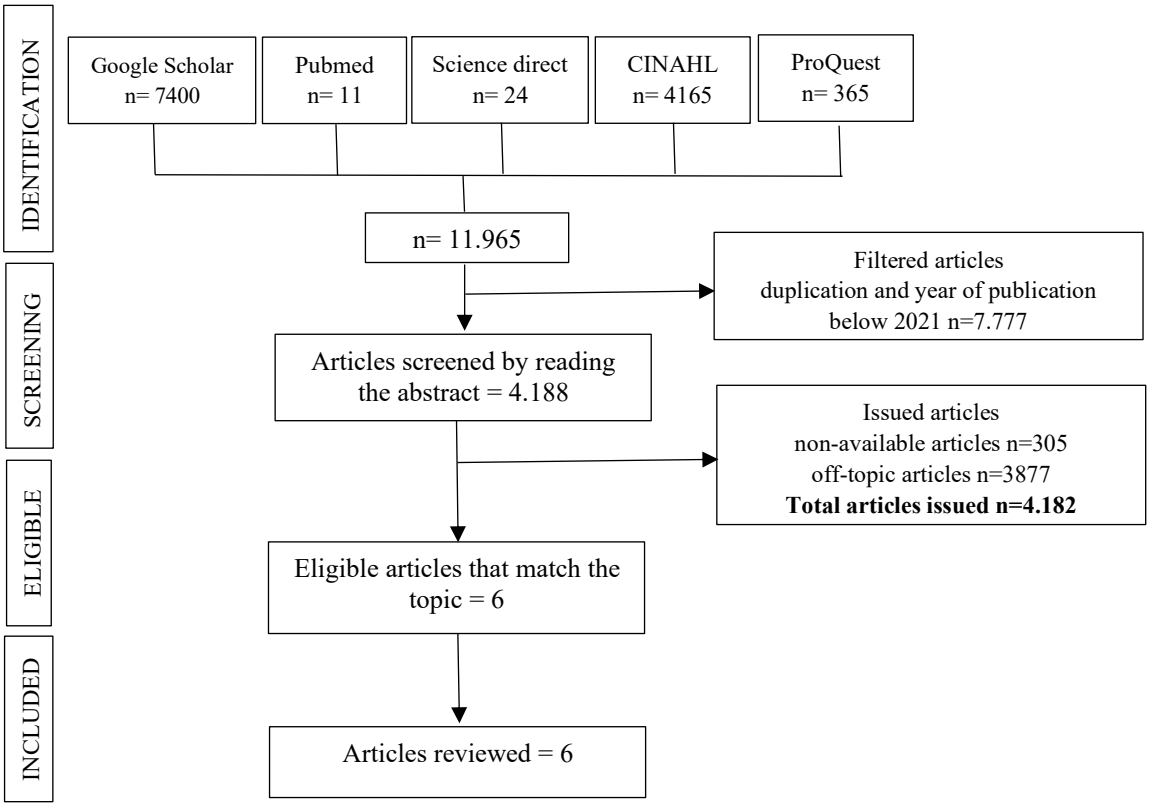
Q5: Were confounding factors identified?

Q6: Were strategies to deal with confounding factors stated?

Q7 Were the outcomes measured in a valid and reliable way?

Q8: Was appropriate statistical analysis used?
Q9: Was the sample size adequate?
Q10: Was the response rate adequate, and if not, was it properly managed?
Q11: Was information about the reliability and validity of measurement tools provided?

Figure 1. PRISMA Flow Diagram



RESULT AND DISCUSSION

Table 2. Results of Literature Review

No	Author	Title	Design Study	Outcomes
1.	Bergström et al., (2025)	Addressing documentation deficiencies in emergency department records: Implications for fall risk assessment and holistic care in older adults	Retrospective with Medical Record review	Factors influencing fall risk among patients in the Emergency Department (ED): Cardiovascular disease (64.8%), dementia (16.5%), cognitive impairment (35.9%), functional activity impairment (41.8%), history of previous falls and fractures (15.6%), mobility disorders or use of assistive walking devices (31.6%).

2.	Mulfiyanti et al., (2024)	Factor Analysis of the Application of Patient Safety Target Targets The Risk of Falling in the Emergency Room of the Hospital	Quantitative Descriptive Cross Sectional	The study demonstrates that educational background, patient safety training, and nurses' knowledge are significantly correlated with the implementation of patient safety practices in fall prevention within the Emergency Department. Conversely, variables such as age and the availability of infrastructure and facilities did not exhibit a statistically significant association.
3.	García-Martínez et al., (2024)	Probability of new falls and factors associated with them in aged patients treated in emergency departments after falling: data from the FALL-ER registry	Observational Retrospective with medical records	Factors contributing to patient falls in the Emergency Department include cognitive impairment, mobility disorders, and polypharmacy.
4.	Barton et al., (2024)	Academic Detailing as a Health Information Technology Implementation Method: Supporting the Design and Implementation of an Emergency Department–Based Clinical Decision Support Tool to Prevent Future Falls	Qualitative Explorative	A major barrier in managing patients at risk of falling in the Emergency Department is the lack of adequate resources and facilities.
5.	Hellinger et al., (2025)	Impact of an Interprofessional Collaboration Between Physicians and Pharmacists on Fall-Risk-Increasing Drugs in Older Patients with Trauma in the Emergency Department	Quasi Experiment Pretest-posttest	Factors influencing fall risk include fall risk screening and medication use evaluation.
6.	Torun, (2023)	Evaluation of the risk factors for falls in the geriatric population presenting to the emergency department	Prospective Study, Single Center: Cross Sectional	Factors influencing fall risk in patients include a history of falls, polypharmacy, and gait abnormalities

Based on Table 2, the majority of the reviewed articles (66.6%) utilized a cross-sectional study design. From the synthesis of six articles, the factors identified as influencing fall risk among patients include patient conditions, dementia, history of falls, cognitive impairment, mobility impairment, use of assistive walking devices, balance disturbances, medication use (polypharmacy), nurse negligence in conducting fall risk screening, and insufficient human resources in the Emergency Department. Furthermore, the synthesis highlighted that the most significant factors were history of falls and polypharmacy.

Discussion

Analysis Factor of Influencing Patients at Risk of Falling In ED

Table 2 illustrates that fall risk among patients in the Emergency Department (ED) is influenced by a variety of factors originating both from patients' internal conditions and service-related aspects. Common intrinsic factors identified in the literature include dementia, previous history of falls, cognitive impairment, mobility disorders, use of walking aids, balance disturbances, and polypharmacy or concurrent use of multiple medications. These factors impair patients' ability to maintain postural stability, recognize environmental hazards, and adequately compensate physically when moving or changing positions.

Fall risk in ED patients is also affected by various medical and functional conditions. A systematic review analyzing 119 studies found that advanced age (>65 years), mobility impairment, cognitive dysfunction, previous fall history, and the use of certain medications (such as antipsychotics, antidepressants, benzodiazepines, and anticonvulsants) significantly increase the risk of falls in hospital settings. Additionally, medical conditions such as diabetes mellitus, Parkinson's disease, and hyponatremia contribute to elevated fall risk (Heinzmann et al., 2025).

One influential factor is the patient's clinical condition; deterioration may cause falls due to sudden loss of reflexes resulting from physiological changes. For example, patients with cardiovascular disorders may experience limited mobility due to activity intolerance, and forced movement can trigger falls caused by sudden syncope linked to cardiac events (Bergström et al., 2025).

Research shows that over 35% of elderly patients who fall have cognitive impairment or dementia, significantly diminishing their ability to perceive risks and make safe decisions during physical activities. Consequently, patients often attempt tasks without assistance, such as getting out of bed or walking to the bathroom alone, increasing fall risk. Moreover, more than 40% of patients experience mobility limitations and rely on walking aids, reflecting balance and motor function impairments (Bergström et al., 2025). This dependence, without adequate supervision, becomes a trigger for falls, particularly in unfamiliar environments such as the ED.

Polypharmacy (use of five or more medications) has been consistently identified as a major risk factor for falls, especially among the elderly. This is attributed to

medication side effects like orthostatic hypotension, which causes sudden blood pressure drops upon standing, sedation reducing alertness, and acute cognitive disturbances affecting orientation and decision-making. Torun, (2023) confirmed that polypharmacy is an independent predictor of falls in geriatric patients treated in the ED, underscoring the importance of careful medication management in this population. Viana et al., (2022) reported that elderly patients regularly using psychoactive drugs such as antidepressants, benzodiazepines, and antipsychotics have nearly twice the fall risk compared to those not using these medications.

Previous history of falls is among the strongest predictors of recurrent falls, especially in the elderly. Rashid et al., (2019) revealed that older adults who experienced a fall within the past six months had a threefold higher risk of falling again within the following 12 months. This finding emphasizes that a history of falls is not merely incidental but serves as a critical warning signal that healthcare providers must address seriously. Unfortunately, research by Hellinger et al. (2025) also indicates that many patients with a fall history do not receive adequate preventive interventions post-incident. This gap in fall prevention systems within healthcare facilities results in missed opportunities for follow-up and risk monitoring, leaving patients vulnerable to recurrent falls with serious injuries, diminished quality of life, and increased mortality.

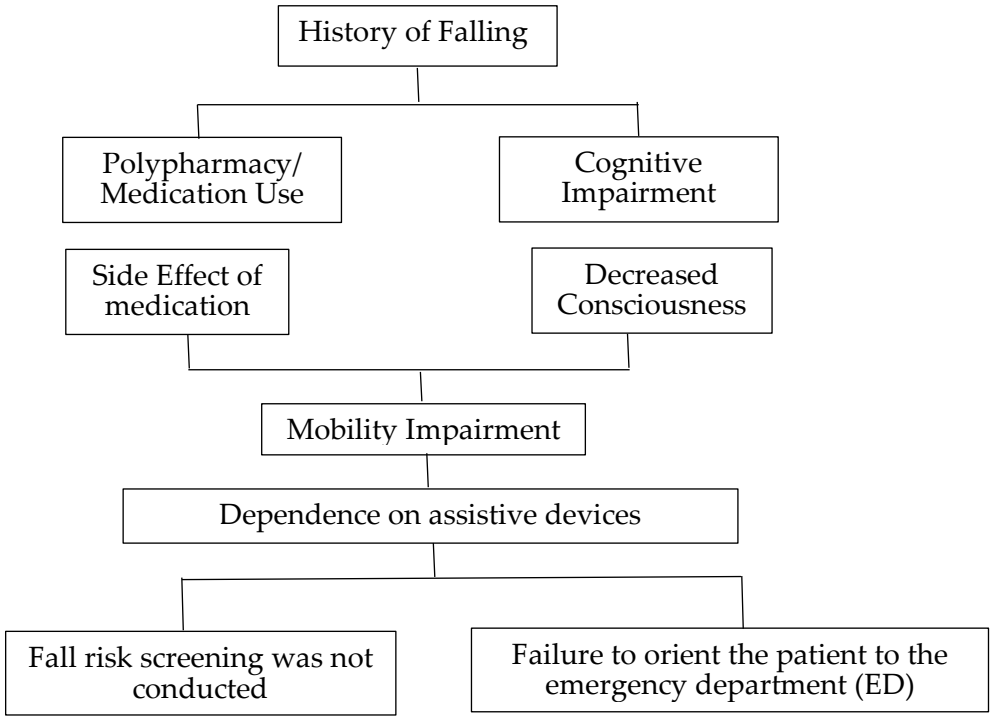
Within healthcare systems, significant challenges hinder effective fall risk screening implementation in the ED. A major barrier is the inconsistent performance of fall risk screening by nurses, often due to limited human resources and high workload in the ED setting. Barton et al., (2024) noted that high work pressure, insufficient specialized training in fall risk identification, and lack of digital tools hamper nurses' ability to conduct rapid and accurate fall risk assessments. Consequently, many at-risk patients remain undetected, limiting opportunities for preventive interventions. Conversely, Tzeng and Yin (2021) demonstrated that implementing technology-based screening protocols, such as clinical decision support systems (CDSS), can enhance fall risk detection by up to 60% in clinical practice. These technologies aid nurses in faster, more accurate decision-making and enable real-time risk monitoring, thus facilitating more efficient and effective preventive actions.

Interrelationship of Risk Factors

The results of the studies indicate that the risk of falls in emergency department (ED) patients arises from the interaction of various interconnected factors. For instance, patients with cognitive impairments or dementia often fail to recognize their physical limitations, leading them to engage in activities without assistance (Van Rensburg et al., 2020). When combined with the use of sedative medications, such as benzodiazepines, the risk of falls increases due to side effects like orthostatic hypotension, dizziness, and altered consciousness (Damoiseaux-Volman et al., 2022).

Additionally, a history of previous falls not only serves as an indicator of risk but also reflects a pre-existing impairment in mobility. This is often exacerbated by the use of unsupported walking aids or by the unfamiliar environment of the ED for elderly patients (Naseer et al., 2022). Healthcare professionals in the ED often face time constraints and heavy workloads. This can result in fall risk screenings being conducted in a non-systematic manner, leading to the inadequate identification of patients with high-risk factors (Schnall et al., 2024). A lack of human resources and training in fall risk assessment further compounds the issue. The following is a visualization of the interrelationships among fall risk factors, based on the results of the synthesis as illustrated in Figure 2.

Figure 2. Interrelationship of Risk Factors



This finding emphasizes the importance of early screening based on fall history and polypharmacy in the emergency department (ED) as a preventive measure. The implementation of standard protocols, nurse training, and optimization of documentation are potential interventions to enhance the safety of elderly patients.

Limitations

Although the literature review provides a comprehensive understanding of various existing studies, several methodological limitations must be acknowledged. The majority of the articles reviewed employ cross-sectional or retrospective study designs, which limit the capacity to robustly establish causal relationships (Hammerton & Munafò, 2021). Furthermore, some articles do not elaborate in detail on the strategies used to address bias or confounding factors, thereby reducing confidence in the internal validity of the studies conducted (Damoiseaux-Volman et al., 2022).

CONCLUSION

Based on the synthesis of various articles, it is evident that a history of falls and concurrent medication use (polypharmacy) are the two most influential factors associated with fall incidents among elderly patients in the Emergency Department (ED). These factors are readily identifiable through initial assessments and can serve as primary indicators in fall risk screening. A systematic approach targeting these factors plays a crucial role in achieving more effective and efficient fall prevention. It is recommended to integrate fall risk screening based on fall history and polypharmacy into the initial patient assessment procedures in the ED. Furthermore, enhancing nurse training and strengthening documentation systems and early interventions are necessary to prevent falls and improve overall patient safety outcomes.

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